| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/696,507 | 10/29/2003 | Allen Samuels | 2006579-0757 (CTX-290) | 5753 |

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| EXAMINER |
|---|
| RIVAS, SALVADOR E |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2619 | |

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|---|---|
| 04/01/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|  | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/696,507 | SAMUELS ET AL. |
|  | Examiner | Art Unit |  |
|  | SALVADOR E. RIVAS | 2619 |  |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>15 January 2008</u>.

2a)☐ This action is **FINAL**.          2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>2-28</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>2-28</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>October 29, 2003</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>01/15/2008</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

1.      This Action is in response to Applicant's amendments filed on January 15, 2008.  **Claims 2-28** are now pending in the present application. **This Action is made non-final**.

### *Drawings*

2.      The drawings are objected to under 37 CFR 1.83(a) because they fail to show a descriptive legend for the elements in the drawings as described in the specification.  Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the

next Office action. The objection to the drawings will not be held in abeyance.

### Claim Rejections - 35 USC § 103

3.     The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains.  Patentability shall not be negatived by the manner in which the
> invention was made.

This application currently names joint inventors.    In considering

patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that

the subject matter of the various claims was commonly owned at the time any

inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor

and invention dates of each claim that was not commonly owned at the time a

later invention was made in order for the examiner to consider the applicability of

35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35

U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1,

148 USPQ 459 (1966), that are applied for establishing a background for

determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.     Determining the scope and contents of the prior art.
2.     Ascertaining the differences between the prior art and the claims at
       issue.
3.     Resolving the level of ordinary skill in the pertinent art.
4.     Considering objective evidence present in the application indicating
       obviousness or nonobviousness.

Claims 2, 6, 8, 10, 12-14, 18, 20, 22 and 24-25 are rejected under 35

U.S.C. 103(a) as being unpatentable over Neale et al. (U.S. Patent Application

Publication # 2003/0131079 A1) in view of Dolson et al. (U.S. Patent

Application Publication # 2004/0006643 A1).

Regarding claims 2 and 14, Neale et al. teach a system for performing by

proxies (Fig.1 102, 106) discovery of a maximum transmission unit of a path

(read as a path MTU Discovery mechanism (paragraph [0028], Lines 2-3))

between a client (Fig. 1 @ 101) and a server (Fig. 1 @ 107) in a more efficient

manner, the system (Fig.1) comprising: a first proxy (Fig.1 @ 102) and a second

proxy (Fig.1 @ 106) for transmitting network packets between a client (Fig. 1 @

101) and a server (Fig. 1 @ 107). However, Neale et al. fails to teach

determining a size for a path maximum transmission unit (PMTU) for transmitting

network packets, repacketizing packets received into packet sizes in accordance

with the size of the PMTU, and transmitting the repacketized packets; and

detecting a packet received from transmission of repacketized packets is

fragmented, and transmitting an acknowledgement packet marked with an

indicator that fragmentation has occurred.

Dolson et al. teach a TCP proxy with the capability to inspect and modify a

TCP stream. For instance, Dolson et al. teach a method for examining segments

(Fig.3 @ 100) to determine if segment requires modifications (Fig.3 @ 104)

([0019]). Also, should the segment require modifications, generating modification

tags for the segment (Fig.3 @ 108, [0020]). Also, Dolson et al, teach a method

for detecting a packet received from transmission of repacketized packets is

fragmented (Fig.8 @ 194, 196, "a test is made to determine if the modified

segment is smaller than the original segment. If the test is true, then processing

moves to step 196. At step 196 a test is made to determine if multiple fragments

exist."). Furthermore, Dolson et al. teach that each state machine (Fig.3 @ 100)

monitors the segments it sends and monitors the acknowledgement coming from

the other side of the connection (Paragraph [0234] Lines 1-3). Therefore, it would

have been obvious to a person of ordinary skill in the art at the time the invention

was made to combine the processing of a segment in the TCP proxy as taught

by Dolson et al. with the system of Neale et al. for the purpose of fragmenting a

data packet coming from a source (e.g., client) into smaller size packets in order

to transmit data to a destination (e.g., server). Also, for the purpose of

determining and establishing the size of data packets being received and

sending a notification acknowledgement along with an indicator of the type of

data packets (even those data packets that have been partitioned due to a limit

of the size of data being exchanged) traveling between client and server

systems.

Regarding **claims 6 and 18**, and **as applied to claims 2 and 14 above**,

Neale et al. teaches a system wherein step (e) comprises generating, by the

second proxy (Fig.1 @ 106), the acknowledgement packet ("when a data packet

arrives at its receiver, an acknowledgement packet is formed ...", paragraph

[0051] Lines 2-4) to have a bit (read as an acknowledgement type bit flag (Fig.5

@ 514)) to indicate that fragmentation has occurred ("... and the bit fields could

indicate contiguous packets, older or newer, ...", paragraph [0050] Lines 13-19).

However, Neale et al., as modified by and Dolson et al., fails to teach a TCP

header.

Dolson et al. teach a TCP header (Fig.2 @ 76). It would have been

obvious to a person of ordinary skill in the art to combine Dolson et al with Neale

et al. for the purpose of TCP header containing a size of data packets field and

establishing a notification acknowledgement field along with an indicator of the

type of data packets (even those data packets that have been partitioned due to

a limit of the size of data being exchanged) traveling between client and server

systems. The motivation being to improve the performance, efficiency, and user

experience of systems transporting TCP/IP traffic.

Regarding **claims 8 and 20**, and **as applied to claim 2 and 14 above**,

Dolson et al., as modified by Neale et al. and, teach a system wherein step (e)

comprises generating (Fig.3 @ 108), by the second proxy, the acknowledgement

packet to have a field in an internet protocol header (Fig.2 @ 74) set to indicate

that fragmentation has occurred (Paragraph [0234] Lines 1-3).

Regarding **claims 10 and 22**, and **as applied to claims 2 and 14 above**,

Neale et al., as modified by Dolson et al., teaches a system (Fig.1) comprising

reducing, by the first proxy (read as PEP1 (Fig.1 @ 102)), the size of the PMTU

in response to receipt of the acknowledgement packet (The PEP intercepts an

ICMP message prompting for the PEP to "reduce its path MTU estimate and

retransmits the data packet into smaller packets..." (paragraph [0047] Lines 20-

21) destined for the server (Fig.1 @ 107)).

Regarding **claim 12 and 24**, and **as applied to claims 10 and 14 above**, Neale et al., as modified by Dolson et al., teaches a system (Fig.1), comprising reducing the size of the PMTU (The PEP intercepts an ICMP message prompting for the PEP to "reduce its path MTU estimate and retransmits the data packet into smaller packets..." (paragraph [0047] Lines 20-21) destined for the server (Fig.1 @ 107)). However, Neale et al, as modified by Dolson et al., fail to teach the reduction of the PMTU size by one-half. One of ordinary skill in the art, would have expected Applicant's invention to perform equally well with Neale et al., as modified by Dolson et al., because as long as the data packets are reduced to a smaller sized compared to the original MTU size the purpose of the transmission of data occurs to a selected receiver (server system) on a given network.

Regarding **claim 13 and 25**, and **as applied to claims 2 and 14 above**, Neale et al., as modified by Dolson et al., teaches a system (Fig.1) wherein step (a) comprising triggering the determination of the PMTU by the first proxy (read as PEP1 (Fig.1 @ 102) "... interact with the PMTUD mechanism", paragraph [0054] Lines 2-3) in response to one of receipt of the indicator that fragmentation has occurred or an elapse of time ("... treatment of the packet stream as a byte stream at the PEP devices and a timer to wait for following packets should be minimize further small (less than path MTU estimate) packets being sent.", paragraph [0054] Lines 6-9).

**Claims 3, 5, 11, 15, 17 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Neale et al. (U.S. Patent Application Publication # 2003/0131079 A1),** in view of **Dolson et al. (U.S. Patent Application**

**Publication # 2004/0006643 A1),** and further in view of **Dempo (U.S. Patent # 6,934,288 B2)**.

Regarding **claims 3 and 15,** and **as applied to claims 2 and 14 above,** Dempo, as modified by Neale et al. and Dolson et al., teaches a system (Fig.1 @ 10) wherein step (a) comprises determining, by the first proxy, a value for the PMTU greater than the current value of the PMTU ("The IP header processing division **30** compares the extracted IP packet (length) with the MTU size to examine whether the IP packet exceeds the MTU size.", Column 5 Lines 13-15).

Regarding **claims 5 and 17,** and **as applied to claims 2 and 14 above,** Dempo, as modified by Neale et al. and Dolson et al., teaches a system wherein step (c) comprises transmitting, by the first proxy (read as Fig.1 @ 102 from the communication system in Neale et al.), the repacketized packets without one of prohibiting fragmentation or setting the defragmentation flag of the packet off ("...the fragmentation processing determination means that the IP packets do not require to have a fragmentation process executed, assembling IP packets from the fixed packets in the order in which they are inputted to the fragmentation processing device and sending them ...", Column 2, Lines 40-45).

Regarding **claims 11 and 23,** and **as applied to claims 10 and 14 above,** Dempo, as modified by Neale et al. and Dolson et al., teaches a system (Fig.1 @ 10) comprising transmitting, by the first proxy, repacketized client packets formed in accordance with the size of the decreased PMTU ("...creating a plurality of IP packets of a size smaller than the MTU size ... in the order in which they are inputted to the fragmentation processing device, sending these IP

packets, ...", Column 2 Lines 34-35).

Claims **4 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Neale et al. (U.S. Patent Application Publication # 2003/0131079 A1),** in view of **Dolson et al. (U.S. Patent Application Publication # 2004/0006643 A1),** and further in view of **Li et al. (U.S. Patent Application Publication # 2004/0001691 A1).**

Regarding **claims 4 and 16**, and **as applied to claims 2 and 14 above**, Li et al., as modified by Neale et al. and Dolson et al., teach a system and method (read as a congestion control mechanism) wherein by the first proxy determines a value for the PMTU by increasing a current value of the PMTU by a predetermined percentage for each round-trip-time that elapses without receipt of the indication that fragmentation has occurred (Paragraph [0006], [0051], and [0052]).

Claims **7 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Neale et al. (U.S. Patent Application Publication # 2003/0131079 A1),** in view of **Dolson et al. (U.S. Patent Application Publication # 2004/0006643 A1),** and further in view of **Donzis et al. (U.S. Patent # 6,973,097 B1).**

Regarding **claims 7 and 19**, and **as applied to claims 2 and 14 above**, Neale et al., as modified by Dolson et al., teach a system (teach PEP2 (Fig.1 @ 106)) wherein step (e) comprises generating, by the second proxy (Fig.1 @ 106), the acknowledgement packet ("when a data packet arrives at its receiver, an acknowledgement packet is formed ...", paragraph [0051] Lines 2-4) set to

indicate that fragmentation has occurred ("...this acknowledgement field may indicate the newest packet acknowledged ... or the oldest packet acknowledged ...", paragraph [0050] Lines 15-17). However, Neale et al., as modified by Dolson et al., fail to teach an option field in a transport control protocol header (read as TCP header (Fig.6 @ 600)).

Donzi et al. teach a TCP header (Fig.6 @ 600)) and an option field (read as option field (Fig.6 @ 612)). It would have been obvious to a person of ordinary skill in the art to combine Donzi et al with Neale et al., as modified by Dolson et al., for the purpose of TCP header containing an option field to be used for acknowledging a repacketizing/fragmentation of data packets. The motivation being to improve the performance, efficiency, and user experience of systems transporting TCP/IP traffic.

**Claims 9 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Neale et al. (U.S. Patent Application Publication # 2003/0131079 A1),** in view of **Dolson et al. (U.S. Patent Application Publication # 2004/0006643 A1),** and further in view of **Badt et al. (U.S. Patent # 5,959,974)**.

Regarding **claims 9 and 21**, and **as applied to claims 2 and 14 above**, Badt et al., as modified by Neale et al. (teaches PEP1 (Fig.1 @ 102)) and Dolson et al., teach a method and system comprising stopping, by the first proxy, PMTU discovery in response to receipt of the acknowledgement packet (Column 6 Lines 16-24).

**Claims 26-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Neale et al. (U.S. Patent Application Publication # 2003/0131079 A1),** in view of **Li et al. (U.S. Patent Application Publication # 2004/0001691 A1),** and further in view of **Dolson et al. (U.S. Patent Application Publication # 2004/0006643 A1).**

Regarding **claim 26**, Neale et al. teach a system for performing by proxies (Fig.1 102, 106) discovery of a maximum transmission unit of a path (read as a path MTU Discovery mechanism (paragraph [0028], Lines 2-3)) between a client (Fig. 1 @ 101) and a server (Fig. 1 @ 107) in a more efficient manner, the system (Fig.1) comprising: a first proxy (Fig.1 @ 102) and a second proxy (Fig.1 @ 106) for transmitting network packets between a client (Fig. 1 @ 101) and a server (Fig. 1 @ 107). However, Neale et al. fails to teach the size of the PMTU increased by a predetermined percentage for each round trip time that elapsed without receipt of an indicator that fragmentation has occurred, determining a size for a path maximum transmission unit (PMTU) for transmitting network packets, repacketizing packets received into packet sizes in accordance with the size of the PMTU, and transmitting the repacketized packets; and detecting a packet received from transmission of repacketized packets is fragmented, and transmitting an acknowledgement packet marked with an indicator that fragmentation has occurred.

Li et al. teach a method for estimating throughput over at least one network connection. For instance, Li et al. teach the method consisting of "… determining packet size information, round trip time information and packet loss

information associated with the network connection, and estimating throughput for the network connection using a logarithmic function that considers this determined information." (Paragraph [0006], [0051], and [0052]) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the TCP-friendly Rate Control logarithm as taught by Li et al. with the system of Neale et al. for the purpose of evaluating the performance and traffic engineering of a communications network.

However, Neale et al. and Li et al. fail to teach determining a size for a path maximum transmission unit (PMTU) for transmitting network packets, repacketizing packets received into packet sizes in accordance with the size of the PMTU, and transmitting the repacketized packets; and detecting a packet received from transmission of repacketized packets is fragmented, and transmitting an acknowledgement packet marked with an indicator that fragmentation has occurred. Dolson et al. teach a TCP proxy with the capability to inspect and modify a TCP stream. For instance, Dolson et al. teach a method for examining segments (Fig.3 @ 100) to determine if segment requires modifications (Fig.3 @ 104) ([0019]). Also, should the segment require modifications, generating modification tags for the segment (Fig.3 @ 108, [0020]). Also, Dolson et al, teach a method for detecting a packet received from transmission of repacketized packets is fragmented (Fig.8 @ 194, 196, "a test is made to determine if the modified segment is smaller than the original segment. If the test is true, then processing moves to step 196. At step 196 a test is made to determine if multiple fragments exist."). Furthermore, Dolson et al. teach that

each state machine (Fig.3 @ 100) monitors the segments it sends and monitors the acknowledgement coming from the other side of the connection (Paragraph [0234] Lines 1-3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the processing of a segment in the TCP proxy as taught by Dolson et al. with the TCP-friendly Rate Control logarithm as taught by Li et al. with the system of Neale et al. for the purpose of fragmenting a data packet coming from a source (e.g., client) into smaller size packets in order to transmit data to a destination (e.g., server). Also, for the purpose of determining and establishing the size of data packets being received and sending a notification acknowledgement along with an indicator of the type of data packets (even those data packets that have been partitioned due to a limit of the size of data being exchanged) traveling between client and server systems.

Regarding **claim 27**, and **as applied to claim 26 above**, Li et al., as modified by Neale et al. and Dolson et al., teach a method (read as a L-TFCR algorithm) further comprising not receiving, by the first proxy, during a next round-trip time a second acknowledgement packet, and determining, by the first proxy, to increase the value of the PMTU by the predetermined percentage (Paragraph [0006], [0051], and [0052]).

**Claim 28** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Neale et al. (U.S. Patent Application Publication # 2003/0131079 A1)**, in view of **Li et al. (U.S. Patent Application Publication # 2004/0001691 A1)**, and

further in view of **Dolson et al. (U.S. Patent Application Publication #
2004/0006643 A1)** and **Badt et al. (U.S. Patent # 5,959,974).**

Regarding **claim 28**, and **as applied to claim 26 above**, Badt et al., as
modified by Neale et al., Dolson et al., and Li et al., teach a method further
comprising stopping, by the first proxy, PMTU discovery responsive to receiving
the acknowledgment packet (Column 6 Lines 16-24).

### *Conclusion*

4.      **THIS ACTION IS MADE NON-FINAL.**  Applicant is reminded of the
extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire
THREE MONTHS from the mailing date of this action.  In the event a first reply is
filed within TWO MONTHS of the mailing date of this final action and the advisory
action is not mailed until after the end of the THREE-MONTH shortened statutory
period, then the shortened statutory period will expire on the date the advisory
action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be
calculated from the mailing date of the advisory action.  In no event, however, will
the statutory period for reply expire later than SIX MONTHS from the mailing
date of this final action.

Any response to this Office Action should be **faxed to** (571) 273-8300 **or
mailed to**:

> Commissioner for Patents
> P.O. Box 1450
> Alexandria, VA 22313-1450

**Hand-delivered responses** should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or early communications from the Examiner should be directed to Salvador E. Rivas whose telephone number is (571) 270-1784. The examiner can normally be reached on Monday-Friday from 7:30AM to 5:00PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Huy D. Vu can be reached on (571) 272- 3155. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application
or proceeding should be directed to the receptionist/customer service whose
telephone number is (571) 272-2600.

*Salvador E. Rivas*
S.E.R./ser

March 18, 2008

/Huy D. Vu/

Supervisory Patent Examiner, Art Unit 2616